WHAT IS CLAIMED IS:

1. A method for evaluating a color picture tube comprising:

displaying on a display surface of a color picture tube a measurement pattern including a plurality of first patterns arranged at different positions relative to fluophor dots of said color picture tube and a plurality of second patterns near said first patterns and sufficiently large relative to said fluophor dots;

obtaining a first image using an imaging element to image said displayed measurement pattern;

obtaining a second image using said imaging element to image while controlling light intake to allow brightness components of no more than about 1% of maximum luminance from said first image to be separated from noise and imaged;

creating a third image by combining said first image and said second image while adjusting scales according to a light intake ratio;

calculating, from said third image, display center positions of said plurality of first patterns using said second pattern positions;

measuring discrete fluophor emission intensity distributions for each of said plurality of first patterns; and

obtaining an electron beam intensity distribution by matching display center positions of said plurality of first patterns and combining said plurality of first patterns.

2. The method for evaluating a color picture tube as described in claim 1, wherein in said step for displaying said measurement pattern, there are at least a predetermined number of said first patterns or said line patterns or said dot patterns having phases, defined by a decimal fraction of a display pitch/fluophor pitch, within a predetermined range relative to a first pattern or a line pattern or a dot pattern serving as a reference.

3. The method for evaluating a color picture tube as described in claim 1, wherein in said step for displaying said measurement pattern, at least two of said second patterns are arranged horizontally or vertically, and in said step for obtaining said third image, a slope of a line connecting said at least two second patterns is calculated and rotational transformation is applied to said image so that said slope is 0.

4. The method for evaluating a color picture tube as described in claim 1, wherein in said step for obtaining said third image, a pitch of said fluophors contained in said second patterns is measured in image element units, and said fluophor pitch is used to calculate an image element size.

5. The method for evaluating a color picture tube as described in claim 1, wherein in said step for obtaining said third image, at least one position of said second patterns is detected from said first image and a corresponding second pattern position is detected from said second image, and an offset between said detected positions is used to detect an offset between said first image and said second image.

6. The method for evaluating a color picture tube as described in claim 1, wherein in said step for displaying said measurement pattern, said measurement pattern is displayed at a plurality of positions on said picture tube display surface, and a position recognition pattern is displayed close to each of said measurement patterns.

7. A method for evaluating a color picture tube, comprising:

displaying on a display surface of a color picture tube a measurement pattern formed from a plurality of basic patterns and auxiliary patterns;

obtaining a first image by imaging said displayed measurement pattern under a first light intake condition;

obtaining a second image by imaging said displayed measurement pattern under a second light intake condition;

obtaining a third image by combining said first image and said second image based on said first light intake condition and said second light intake condition;

determining a display center position of said basic pattern from said auxiliary pattern position information from said third image;

measuring discrete fluophor emission intensity distributions for each of said plurality of basic patterns; and

obtaining an electron beam intensity distribution by matching display center positions of said plurality of basic patterns for which discrete fluophor emission intensity distributions were calculated and combining said plurality of basic patterns; and

outputting information relating to said determined electron beam intensity distribution.

8. The method for evaluating a color picture tube as described in claim 7, wherein said second light intake condition is set so that, in said second image imaged under said second light intake conditions, images associated with areas having a brightness of no more than about 1% of a maximum luminance from said first image are distinguishable from noise.

9. The method for evaluating a color picture tube as described in claim 7, wherein, in said step for displaying a measurement pattern, said measurement pattern is displayed at a plurality of positions on said picture tube display surface, and a position recognition pattern is displayed close to each of said measurement patterns.

10. A method for evaluating a color picture tube, comprising:

displaying a measurement pattern on a display surface of a color picture tube;

obtaining a first image by imaging said displayed measurement pattern under a first light intake condition using an imaging element;

obtaining a second image by imaging said displayed measurement pattern under a second light intake condition using said imaging element;

obtaining a third image having a wider dynamic range than images obtained through imaging with said imaging element by combining said first image and said second image;

measuring a discrete fluophor emission intensity distribution for said measurement pattern; and

obtaining an electron beam intensity distribution using said measured discrete fluophor emission intensity distribution and said calculated data for said plurality of basic patterns; and

outputting information relating to said determined electron beam intensity distribution.

11. The method for evaluating a color picture tube as described in claim 10, wherein in said step for displaying said measurement pattern, said measurement pattern is displayed at a plurality of positions on said picture tube display surface, and a position recognition pattern is displayed close to each of said measurement patterns.

12. The method for evaluating a color picture tube as described in claim 10, wherein said second light intake condition is set so that, in said second image imaged

under said second light intake conditions, images associated with areas having a brightness of no more than about 1% of a maximum luminance from said first image are distinguishable from noise.

13. The method for evaluating a color picture tube as described in claim 10, wherein said third image with said wide dynamic range provides noise separation in a range of about 1% to about 100% of a maximum luminance of said image.

14. A device for evaluating a color picture tube, comprising:

a display generator to display on a display surface of a color picture tube a measurement pattern including a plurality of basic patterns arranged at different positions relative to fluophor dots of said color picture tube and at least three auxiliary patterns near said basic patterns and sufficiently large relative to said fluophor dots;

an imager to obtain a first image using an imaging element to image said displayed measurement pattern and obtain a second image using said imaging element to image while controlling light intake to allow brightness components of no more than about 1% of maximum luminance from said first image to be separated from noise and imaged;

an image processor to create a third image by combining said first image and said second image while adjusting scales according to a light intake ratio;

a first calculating unit to calculate from said third image display created by said image processor a display center positions for each of said plurality of basic patterns using said auxiliary pattern positions;

a measuring unit to measure discrete fluophor emission intensity distributions for each of said plurality of basic patterns; and

a second calculating unit to obtain an electron beam intensity distribution by matching display center positions calculated by said first calculating unit and combining said plurality of basic patterns.

15. The device for evaluating color picture tubes as described in claim 14, wherein in said display generator, there are at least a predetermined number of said basic patterns or said line patterns or said dot patterns having phases, defined by a decimal fraction of a display pitch/fluophor pitch, within a predetermined range relative to a basic pattern or a line pattern or a dot pattern serving as a reference.

16. The device for evaluating color picture tubes as described in claim 14, wherein in said image processor, at least two of said auxiliary patterns are arranged horizontally or vertically and, in a step for obtaining said third image, a slope of a line connecting said at least two auxiliary patterns is calculated and rotational transformation is applied to said image so that said slope is 0.

17. The device for evaluating color picture tubes as described in claim 14, wherein said image processor measures a pitch of said fluophors contained in said auxiliary patterns in image element units, and said fluophor pitch is used to calculate an image element size.

18. The device for evaluating color picture tubes as described in claim 14, wherein said image processor detects at least one position of said auxiliary patterns from said first image and detects a corresponding auxiliary pattern position from said second image, and an offset between said detected positions is used to detect an offset between said first image and said second image.

19. The device for evaluating color picture tubes as described in claim 14, wherein said image processor displays said measurement pattern at a plurality of positions on said picture tube display surface, and displays a position recognition pattern close to each of said measurement patterns.

20. A device for evaluating a color picture tube, comprising:

a displaying unit to display a measurement pattern, including a basic pattern and an auxiliary pattern, on a display surface of a color picture tube;

an imaging unit to obtain a first image by imaging said displayed measurement pattern under a first light intake condition using an imaging element and obtaining a second image by imaging said displayed measurement pattern under a second light intake condition using said imaging element;

a processing unit to create a third image by combining said first image and said second image obtained from said imaging unit based on said first light intake condition and said second light intake condition;

a first calculating unit to determine a display center position of said basic pattern from said auxiliary pattern position information from said third image created by said processing unit;

a measuring unit to measure discrete fluophor emission intensity distributions for each of said plurality of basic patterns; and

a second calculating unit to determine an electron beam intensity distribution by using display center position data calculated by said first calculating unit and combining said discrete fluophor emission intensity distributions measured for each of said basic patterns by said measuring unit; and

an outputting unit to output information relating to said determined electron beam intensity distribution.

21. The device for evaluating a color picture tube as described in claim 20, wherein said second light intake condition of said imaging unit is set so that, in said second image imaged under said second light intake conditions, images associated with areas having a brightness of no more than about 1% of a maximum luminance from said first image are distinguishable from noise.

22. The device for evaluating a color picture tube as described in claim 20, wherein said displaying unit displays said measurement pattern at a plurality of positions on said picture tube display surface, and a position recognition pattern is displayed close to each of said measurement patterns.

23. A device for evaluating a color picture tube, comprising:

means for displaying patterns displaying a measurement pattern on a display surface of a color picture tube;

means for imaging obtaining a first image and a second image by imaging said displayed measurement pattern under a first light intake condition and a second light intake condition;

means for generating images creating a third image having a wider dynamic range than images obtained through imaging with said imaging means by combining said first image and said second image obtained with said imaging means;

means for measuring discrete fluophor emission intensity distribution measuring discrete fluophor emission intensity distribution for said plurality of basic patterns; and

means for determining an intensity distribution of an electron beam beamed to said display surface of said color picture tube using discrete fluophor emission intensity distribution information measured by said discrete fluophor emission intensity distribution

measuring means and information of said third image generated by said image generating means; and

outputting information relating to said determined electron beam intensity distribution.

24. The device for evaluating a color picture tube as described in claim 23, wherein said pattern displaying means displays said measurement pattern at a plurality of positions on said picture tube display surface, and a position recognition pattern is displayed close to each of said measurement patterns.

25. The device for evaluating a color picture tube as described in claim 23, wherein said second light intake condition of said imaging means is set so that, in said second image imaged under said second light intake conditions, images associated with areas having a brightness of no more than about 1% of a maximum luminance from said first image are distinguishable from noise.

26. The device for evaluating a color picture tube as described in claim 23, wherein said third image generated by said image generating means provides noise separation in a range of about 1% to about 100% of a maximum luminance of said image.

27. A method for making color picture tubes, comprising:

assembling a plurality of electrodes using an electron gun assembly process;

using an electron gun sealing process, placing an electron gun assembled in said electron gun assembly process in a bulb, forming a vacuum, and sealing said bulb;

assembling a deflector yoke onto said bulb and performing inspection and adjustment of image quality using an image quality inspection/adjustment process, said bulb assembled with said deflector yoke being sent to a next process when said image quality inspection/adjustment process is passed successfully, wherein, said image quality inspection/adjustment process includes:

displaying a measurement pattern on a screen of said bulb assembled with said deflection yoke,

obtaining a first image by imaging said displayed measurement pattern using an imaging element under a first light intake condition,

obtaining a second imaged by imaging said displayed measurement pattern using said imaging element under a second light intake condition,

obtaining a third image with a wider dynamic range obtained by imaging with said imaging element by combining said first image and said second image,

using said third image to determine an intensity distribution of an electron beam beamed to said display surface of said bulb assembled with said deflection yoke, and

approving said inspection if said determined intensity distribution is within a predetermined range.

28. The method for making color picture tubes of claim 27, wherein if an irregularity is detected in quantitative evaluation of emission distribution in said image quality inspection/adjustment process, information relating to said irregularity is passed on to at least one of the following: said electron gun assembly process, said electron gun sealing process, and said image quality inspection/adjustment process.

29. The method of claim 1, wherein said first patterns are basic patterns and said second patterns are auxiliary patterns.

30. The method of claim 29, wherein there are at least three auxiliary patterns.